

## REMARKS

Claims 2-62 are pending in the application. Claims 1, 9, 16-18, and 55-62 were rejected. Claims 19-54 were found to be allowable and claims 2-8 and 10-15 were objected to as depending from a rejected claim.

Claim 1 has been cancelled. Claim 2 has been amended to be rewritten in independent form to incorporate the features of claim 1. Claims 8-10, 12, and 16-18 have been amended to depend from claim 2. Claim 24 has been amended to correct a typographical error. Claims 60-62 have been amended, without a change in scope, to incorporate the features of the claims from which they previously depended to more clearly illustrate the features of such claims. Claims 55, 56, and 58-62 have been amended to change the term "energy-frequency" to "energy/frequency" and the term "energy-signature" to "energy/signature" in accordance with the terminology used in the specification on pages 9-16. No new matter has been added.

Reconsideration is requested in view of the following remarks.

## Objection to Specification

The Specification was objected to as allegedly failing to teach adequately how to make and to use the invention because it did not have proper section headings. The Specification has been amended to add section headings. In view of the amendments to the Specification, Applicants respectfully request that the objection to the Specification be withdrawn.

## Response to Rejection Under 35 U.S.C. §112, First Paragraph

Claim 62 was rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the enablement requirement. In particular, the Examiner alleged that claim 62 is a single means claim presented to claim a "radar system," but only sets forth "data processing means" in the claim. Applicant respectfully asserts that claim 62 is not a single means claim.

Claim 62 has been rewritten, without changing its scope, to incorporate the features of the dependent claims from which it previously depended and the currently amended claim 62 now depends from claim 23. In its rewritten form, it is clear that claim 62 does not only set forth a data processing means and is not a single means claim. Accordingly, Applicant respectfully requests that the rejection of claim 62 under 35 U.S.C. §112 be withdrawn.

Response to Rejection Under 35 U.S.C. §112, Second Paragraph

Claims 55-59 were rejected under 35 U.S.C. §112, second paragraph, for using the term “broad band” which the Examiner alleged is indefinite and unclear in context in that the use does not agree with the disclosure of conventional pulse radar with a PRF. Applicant respectfully disagrees.

The term “broadband” is defined by the Merriam-Webster online dictionary as “operating at, responsive to, or comprising a wide band of frequencies” (copy enclosed as Exhibit A hereto). Claim 55 uses the term broad band, meaning comprising a wide band of frequencies, to disclose the feature of the transmitter antenna that transmits a pulsed, broad band frequency signal. In other words, the transmitter antenna transmits pulses comprising a wide band of frequencies. This use of the term pulses is consistent with the transmission of a wide band of frequencies.

As known to one of ordinary skill in the art, a pulse that is short in the time domain comprises signals of a relatively wide range of frequencies in the frequency domain. Further, a pulse that is long in the time domain comprises signals of a relatively narrow range of frequencies in the frequency domain. In other words, the bandwidth in the frequency domain of a signal resulting from a pulse is inversely proportional to the width of the pulse in the time domain. Thus, the terminology as used in claim 55 would be understood to one of ordinary skill in the art and is illustrated by the diagram enclosed as Exhibit B hereto (<http://mri.swmed.edu/PhysWebOld/mriphys2/sld007.htm>). Accordingly, the use of the term broad band does agree with the disclosure of a pulsed signal and Applicant respectfully requests that the rejection of claims 55-59 under 35 U.S.C. §112, second paragraph, be withdrawn.

Claims 55-62 were rejected under 35 U.S.C. §112, second paragraph, for using the terms “energy-frequency signature,” “energy frequency signatures,” and “energy-frequency spectrum,” which the Examiner alleges are indefinite and unclear in context. The terms “energy frequency,” “energy-frequency,” and “energy/frequency” are clearly defined in the specification on page 52, line 14 through page 54, line 24. The energy/frequency spectrum is defined in the specification to be time domain data received by the receiver that has been transformed into the frequency domain. The energy frequency signature is the energy/frequency spectrum of a particular material that is used according to the invention as a reference spectrum to identify the presence of the particular material. Thus, the use of the terms energy/frequency spectrum and energy/frequency signature in claims 55-62 is clear and definite and Applicant respectfully

requests that the rejection of claims 55-62 under 35 U.S.C. §112, second paragraph, be withdrawn

Claim 60 was rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for having a step in the method claim refer to another claim. Claim 60 has been rewritten in independent form. Accordingly, Applicant respectfully requests that the rejection of claim 60 under 35 U.S.C. §112, second paragraph, be withdrawn.

Claims 61-62 were rejected under 35 U.S.C. §112, second paragraph, as allegedly not referring to another claim only in the alternative. Claims 61 has been rewritten in independent form. Claim 62 has been amended to depend only from claim 23. Accordingly, Applicant respectfully requests that the rejection of claims 61-62 under 35 U.S.C. §112, second paragraph, be withdrawn.

Claim 62 was rejected under 35 U.S.C. §112, second paragraph, as allegedly being a single-means claim. As discussed above, claim 62 was amended to more clearly illustrate that it is not a single means claim. Accordingly, Applicant respectfully requests that the rejection of claim 62 under 35 U.S.C. §112, second paragraph, be withdrawn.

Claim 9 was rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite and unclear due to the use of a stray comma at the beginning of claim 9. A stray comma is not evident on Applicant's copy of claim 9. However, claim 9 has been amended to remove the a stray parenthesis from the beginning of claim 9. Accordingly, Applicant respectfully requests that the rejection of claim 9 under 35 U.S.C. §112, second paragraph, be withdrawn.

#### **Response to Rejection Under 35 U.S.C. §102(e)**

Claim 1 was rejected under 35 U.S.C. §102(e), as allegedly being anticipated by U.S. Patent No. 6,317,097 to Smith (the "Smith patent") or U.S. Patent No. 6,370,398 to Kanamaluru et al. (the "Kanamaluru patent"). Claims 1 and 17 were rejected under 35 U.S.C. §102(e), as allegedly being anticipated by U.S. Patent No. 6,037,908 to Phillips et al. (the "Phillips patent"). Claim 1 has been cancelled. Claim 2 was objected to for depending from a rejected claim. Claim 2 has been rewritten in independent form to incorporate the features of claim 1 and should now be allowable. Claim 17 has been amended to depend from claim 2 and should therefore also

be allowable. Accordingly, Applicant respectfully requests that the rejections under 35 U.S.C. §102(e) be withdrawn.

**Response to Rejection Under 35 U.S.C. §102(b)**

Claims 1 and 17 were rejected under 35 U.S.C. §102(b), as allegedly being anticipated by U.S. Patent No. 4,626,773 to Kroeger et al. (the “Kroeger patent”) or the article by C.P. Vlahacos et al. dated April 6, 1998 and titled “Quantitative Topographic Imaging Using a Near-Field Scanning Microwave Microscope” (the “Vlahacos article”). Claim 1 has been cancelled. Claim 17 has been amended to depend from claim 2 which was objected to for depending from a rejected claim. Claim 2 is rewritten in independent form and is deemed to be allowable and claim 17, depending from claim 2, should also be allowable. Accordingly, Applicant respectfully requests that the rejection under 35 U.S.C. §102(b) be withdrawn.

**Response to Rejection Under 35 U.S.C. §103(a)**

Claim 16 and 18 were rejected under 35 U.S.C. §103(a), as allegedly being unpatentable over U.S. Patent No. 4,626,773 to Kroeger et al. (the “Kroeger patent”). Claims 2-8 and 10-15 were objected to as depending from a rejected claim. Claims 16 and 18 have been amended to depend from claim 2 which has been rewritten in independent form and should now be allowable. Accordingly, Applicant respectfully requests that the rejection under 35 U.S.C. §103(a) be withdrawn.

**Allowable Subject Matter**

Claims 2-8 and 10-15 were objected to as being dependent upon a rejected claim. Claim 2 has been rewritten in independent form and should now be allowable. Claims 3-8 and 10-15 depend from claim 2 and also should be allowable. Accordingly, Applicants respectfully request that the objection to claims 2-8 and 10-15 be withdrawn.

The claims of the application are believed to be in condition for allowance. An early Notice of Allowance of claims 2-62 is earnestly solicited.

Respectfully Submitted,  
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One entry found for **broadband**.Main Entry: **broad-band**

Pronunciation: 'brod-ən̸d

Function: *adjective*

Date: 1956

- 1 : operating at, responsive to, or comprising a wide band of frequencies <a *broadband* radio antenna>
- 2 : of, relating to, or being a communications network in which a frequency range is divided into multiple independent channels for simultaneous transmission of signals (as voice, data, or video)

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\&\&as ur/er in further

\a\ as a in ash

\e\ as e in bet

\E\ as ea in easy

\g\ as g in go

\i\ as i in hit

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\oi\ as oy in boy

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\ch\ as ch in chin

\I\ as i in ice  
\j\ as j in job  
\(ng)\ as ng in sing  
\O\ as o in go

\ü\ as oo in boot  
\u\ as oo in foot  
\y\ as y in yet  
\zh\ as si in vision

For more information see the [Guide To Pronunciation](#).

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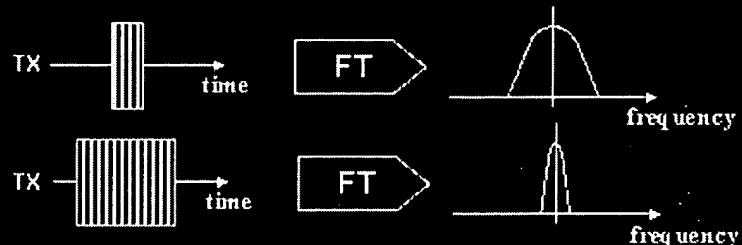
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## RF Pulse Bandwidth (BW)

BW is inversely proportional to RF pulse duration:



Slice select gradient is scaled based on BW:

$$G_{ss} = \frac{2\pi \cdot BW}{\gamma \cdot t_s}$$

where  $t_s$  is the desired slice thickness